SAMPLE PLAN #1: KARST COMMONS

SITE DESCRIPTION:

- Subdivision in Western VA, Karst
- Lots approximately 1/3 acre
- Approved plan has one very large basin to address detention & MS-19. Basin is on lots
- Runoff collected and conveyed to basin in ditches & culverts
- Mostly B, some C soils

STEP 1: CLASSIFY THE SITE:

New Development

STEP 2: ASSESS UNIQUE CIRCUMSTANCES

None

STEP 3: DRAINAGE AREA & POST-DEVELOPMENT IMPERVIOUS

- DA = 23.82 acres
- Post-Development I = 25%

STEP 4: DETERMINE IMPERVIOUS COVER CATEGORY

- Low Impervious (< 40%)
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STEP 5: EARLY ASSESSMENT OF LID CREDITS

Possible LID Credits to try at site:

- #5 – On-Lot Practices
- #6 – Rainwater Harvesting
- #7 – Soil Amendments
- #10 – Grass Channels
- #11 – Other Impervious Disconnection

After discussion with developer, #7 & 10 are most feasible.*

*Project is good candidate for cluster or open space design to work around existing karst features. The ability to do this depends on local zoning and subdivision codes as well as provision of water and sewer to smaller lots. For the sake of this sample plan, the existing layout was retained.

STEP 6: APPLY LID CREDITS

- #7 – On-Lot Soil Amendments: 21 lots with 2,000 s.f. of amended soil on each = 1.0 acre
- #10 – Grass Channels: 1.5 impervious acres draining to grass channel. ½ in B soils, ½ in C soils

Adjusted Impervious Cover: Reduced from 25% to 19%

Adjusted BMP Removal Rate: TP Reduced from 60% to 48%

Structural BMP Selected: Bioretention #1

STEP 7: BMP LOOKUP TABLE

N/A

STEP 8: DESIGN PRACTICES

- 10 Distributed, small-scale infiltration bioretention areas
- Strategically located in drainage system, within drainage easements
- Approximately 30’ x 30’ each
- Eliminates at least 4,000 cubic feet from basin
- Cost = approximately $80K

Final design as per specs in updated Handbook

SAMPLE PLAN #2: LITTLE CREEK COMMERCIAL

SITE DESCRIPTION:

- Small commercial
- Limited space
- Intermittent stream along back property boundary
- Approved plan has large basin to handle detention & MS-19

STEP 1: CLASSIFY THE SITE:

New Development

STEP 2: ASSESS UNIQUE CIRCUMSTANCES

None

STEP 3: DRAINAGE AREA & POST-DEVELOPMENT IMPERVIOUS

- DA = 2.16 acres
- Post-Development I = 53%

STEP 4: DETERMINE IMPERVIOUS COVER CATEGORY

- High Impervious (> 40%)
- %RR = 60% for TP, 55% for TN (BMP Lookup Table)

STEP 5: EARLY ASSESSMENT OF LID CREDITS

Possible LID Credits to try at site:

- #2 – Include buffer on intermittent stream
- #8 – Pervious Parking
- #10 – Grass Channels

After discussion with developer, #2 selected as best option

STEP 6: APPLY LID CREDITS

- #2 – Riparian Buffer: variable-width buffer along intermittent stream = 0.2 acres*

* Could also use Credit #1 (reforesting buffer) if existing buffer is not forested.

Adjusted Impervious Cover: Reduced from 53% to 48%

Adjusted BMP Removal Rate: TN Reduced from 55% to 44%

Structural BMP Selected: Bioretention #1

STEP 7: BMP LOOKUP TABLE

N/A

STEP 8: DESIGN PRACTICES

- 3 bioretention areas with bioswale connecting 2 of them = 1,350 s.f.
- Use rain tanks or underground storage for detention – eliminate basin
- Redirect roof drains to divide drainage
- Cost = approximately $30K (not counting underground storage)

Final design as per specs in updated Handbook

SAMPLE PLAN #3: CREEK VIEW

SITE DESCRIPTION:

- Residential, small lots (generally 0.15 acre or less)
- Site has stream, flood plain, and existing 100' stream buffer requirement
- Steep grades over entire site
- Curb & gutter and storm sewer convey almost all site runoff to one discharge point

STEP 1: CLASSIFY THE SITE:

New Development

STEP 2: ASSESS UNIQUE CIRCUMSTANCES

None

STEP 3: DRAINAGE AREA & POST-DEVELOPMENT IMPERVIOUS

- DA = 6.66 acres (entire site) (*Note: site could be divided into small DA units*)
- Post-Development I = 45%

STEP 4: DETERMINE IMPERVIOUS COVER CATEGORY

- High Impervious (> 40%)
- %RR = 55% for TP, 45% for TN (BMP Lookup Table)

STEP 5: EARLY ASSESSMENT OF LID CREDITS

Possible LID Credits to try at site:

- #2 – Expand size of buffer on "outparcel" (Lot 30)
- #3 – Take credit for Lot 10 open space
- #4 – Make modifications to for Lot 10 open space to be "hydrologically functional" – C soils
- #5 – On-lot rain gardens or dry wells
- #6 – Rain barrels for each lot
- #10 – Grass Channels – generally too steep to meet standards

Since open space is planned into the project anyway, plan is to use #4 (hydrologically-functional open space). In current plan, all runoff by-passes open space, so modifications are needed. Also, #2 is good candidate, but Lot 30 is now considered a separate project.

STEP 6: APPLY LID CREDITS

- #4 – Hydrologically-functional open space = 1.166 acres
- If #2 could be used, stream buffer could be expanded from 100' to 150' = 0.63 acres of additional buffer (not taking credit for this at this time)

Adjusted Impervious Cover: Reduced from 45% to 36%

Adjusted BMP Removal Rate: TN Reduced from 45% to 27%

Structural BMP Selected: Only structural BMPs needed are those to make open space hydrologically-functional – BMPs to split and distribute flow across open space parcel. Selected biofilters & bioswale.

STEP 7: BMP LOOKUP TABLE

N/A

STEP 8: DESIGN PRACTICES

- Create 2 additional storm sewer outfalls so all runoff is not concentrated to one point
- At each outfall, a silt trap used for E&S will be converted to a biofilter
- Biofilters connected by bioswale along contour – designed to spread flow across open space parcel
- Cost = approximately $40K

Final design as per specs in updated Handbook

SAMPLE PLAN #4: CORNER COMMERCIAL

SITE DESCRIPTION:

- Small, infill parcel commercial (0.75 acre)
- Existing storm sewer in street ROW
- Existing plan has biofilter

STEP 1: CLASSIFY THE SITE:

New Development

STEP 2: ASSESS UNIQUE CIRCUMSTANCES

None

STEP 3: DRAINAGE AREA & POST-DEVELOPMENT IMPERVIOUS

- DA = 0.75 (entire site)
- Post-Development I = 75%

STEP 4: DETERMINE IMPERVIOUS COVER CATEGORY

- High Impervious (> 40%)
- %RR = 70% for TP, 60% for TN (BMP Lookup Table)

STEP 5: EARLY ASSESSMENT OF LID CREDITS

Possible LID Credits to try at site:

- #6 – Rainwater harvesting (not a lot of landscaping for reuse of water)
- #8 – Pervious Parking – expensive & maintenance is concern
- #10 – Grass Channels – generally too steep to meet standards

Not a lot of good LID options, so going with BMP Lookup Table

STEP 6: APPLY LID CREDITS

N/A

STEP 7: BMP LOOKUP TABLE

Select Bioretention #2

STEP 8: DESIGN PRACTICES

- Biofilter shown on plan meets specifications
- Modifications needed to increase soil media depth, remove filter fabric, and enhance planting plan
- Cost = approximately $20K

Final design as per specs in updated Handbook